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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,255

06/09/2006

Takeshi Kawamura

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EXAMINER

JACOBS, TODD D

ART UNIT

PAPER NUMBER

3746

NOTIFICATION DATE

DELIVERY MODE

09/03/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

Office Action Summary	Application No. 10/563,255	Applicant(s) KAWAMURA ET AL.	
	Examiner TODD D. JACOBS	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/4/2006, 9/1/2006, 7/29/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-6 (withdrawing claim 7) in the reply filed on 7/13/2009 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Shibayama et al (WO 03/023229)

4. Note that for the purposes of this examination, the Shibayama national stage PGPub 2004/0173312 will be used as a reference/translation for the above cited WIPO document.

5. In re claim 1, Shibayama discloses an evacuation apparatus comprising: a first vacuum pump (20, note paragraph 69 line 6 states that this is a “dry vacuum pump”, and more specifically a “Roots-type” as indicated in paragraph 95, line 2) connected to a vacuum chamber (see 1 on fig 11); and a second vacuum pump (30, note that this is a vacuum pump as stated in paragraph 93, line 10) connected to said first vacuum pump; wherein said first vacuum pump has a pair of multistage pump rotors (see fig 1 for example, R1, R6); and wherein said first vacuum serves as a booster pump (this is a Root-type pump and is therefore a booster pump). Please note that the claims are directed to apparatus which must be distinguished from the prior art in term of structure rather function [MPEP 2144]. Hence, the functional limitations “for increasing a pumping speed of said second vacuum pump” which are narrative in form have not been given any patentable weight. In order to be

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given patentable weight, a functional recitation must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language.

In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir.

1997). Further note that the first pump makes the second pump capable of

increasing a pump speed, since as stated throughout the specification of

Shibayama, the second pump speed is based on a particular percentage of the first pump speed – if the pump speed of the first is increased (which it is as described on paragraph 41) the pump speed of the second can thereby be increased.

6. In re claim 2, Shibayama discloses an evacuation apparatus according to claim 1, wherein each of said multistage pump rotors has an inlet-side rotor (R1) and an outlet-side rotor (R6), and an axial width of said inlet-side rotor is larger than an axial width of said outlet-side rotor (see figs 19-20, and paragraph 80, lines 2-4).

7. In re claim 3, Shibayama discloses an evacuation apparatus according to claim 1, wherein said first vacuum pump is started after said second vacuum pump is started (see paragraph 40, “after the pressure of said vacuum processing chamber has reached the predetermined pressure [via the auxiliary or in this case, the second pump], said main pump [or in this case, the first pump] is started to be driven”.

8. In re claim 4, Shibayama discloses an evacuation apparatus according to claim 1, wherein a rotational speed of said multistage pump rotors is controlled based on a pressure of a gas delivered by said evacuation apparatus (as stated above, Shibayama states “after the pressure of said vacuum processing chamber has reached the predetermined pressure, said main pump is started to be driven”; note that the gas delivered by the evacuation apparatus of Shibayama is the same gas that is in the vacuum processing chamber and further note that the main pump is being controlled based on the pressure of that gas [albeit when it is in the vacuum

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processing chamber] since the main pump starts when that gas reaches a certain pressure.

Regarding future amendments, note that it likely would have been obvious to move the pressure sensor to after the pumps instead of before.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crinquette et al (4,887,941) in view of Ohmi et al (6,896,490) in further view of Ojima et al (2002/0197171).

11. In re claim 1, Crinquette discloses an evacuation apparatus comprising: a first vacuum pump **(A)** connected to a vacuum chamber **(E)**; and a second vacuum pump **(B)** connected to said first vacuum pump; wherein said first vacuum increases a pumping speed of said second vacuum pump serving as a main pump (note that as disclosed in col 2, line 54 to col 3, line 1, pump A is started and once that pressure gets to a certain point pump B is started; therefore, pump A increases the pumping speed of pump B).

12. However, Crinquette fails to disclose wherein said first vacuum pump is a multistage pump. Nevertheless, Ohmi discloses that there may be multistage vacuum pumps in series (see abstract lines 6-9). Among other advantages, using multi stage rotors allows more efficient and potentially higher power pumps to be employed. Therefore, it would have been obvious to one having ordinary skill in the art to modify Crinquette in view of Ohmi by using the vacuum pumps of Crinquette to be each multistage vacuum pumps in order to have a more efficient and powerful assembly.

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13. Nevertheless, Crinquette/Ohmi fail to disclose that there are rotors that are part of the multistage pumps (or roots/booster pumps). However, Ojima discloses a multistage vacuum pump that utilizes roots/rotors (see Ojima 51a, 51b, 51c) to perform the pump operation. Using this type of pump allows this one to work high volume or high vacuum systems. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Crinquette/Ohmi in view of Ojima in order to use the device in high volume/high vacuum systems.

14. In re claim 2, Crinquette/Ohmi/Ojima disclose an evacuation apparatus according to claim 1, wherein each of said multistage pump rotors has an inlet-side rotor and an outlet-side rotor (51a and 51c of Ojima respectively), and an axial width of said inlet-side rotor is larger than an axial width of said outlet-side rotor.

15. In re claim 1, Crinquette discloses an evacuation apparatus comprising: a first vacuum pump **(B)** connected to a vacuum chamber (E); and a second vacuum pump **(A)** connected to said first vacuum pump. Please note that the claims are directed to apparatus which must be distinguished from the prior art in term of structure rather function [MPEP 2144]. Hence, the functional limitations “for increasing a pumping speed of said second vacuum pump” which are narrative in form have not been given any patentable weight. In order to be given patentable weight, a functional recitation must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language. ***In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).***

16. However, Crinquette fail to disclose wherein said first vacuum pump is a multistage pump. Nevertheless, Ohmi discloses that there may be multistage vacuum pumps in series (see abstract lines 6-9). Among other advantages, using multi stage rotors allows more efficient

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and potentially higher power pumps to be employed. Therefore, it would have been obvious to one having ordinary skill in the art to modify Crinquette in view of Ohmi by using the vacuum pumps of Crinquette to be each multistage vacuum pumps in order to have a more efficient and powerful assembly.

17. Nevertheless, Crinquette/Ohmi fail to disclose that there are rotors that are part of the multistage pumps (or roots/booster pumps). However, Ojima discloses a multistage vacuum pump that utilizes roots/rotors (see Ojima 51a, 51b, 51c) to perform the pump operation. Using this type of pump allows this one to work high volume or high vacuum systems. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Crinquette/Ohmi in view of Ojima in order to use the device in high volume/high vacuum systems.

18. In re claim 2, Crinquette/Ohmi/Ojima disclose an evacuation apparatus according to claim 1, wherein each of said multistage pump rotors has an inlet-side rotor and an outlet-side rotor (51a and 51c of Ojima respectively), and an axial width of said inlet-side rotor is larger than an axial width of said outlet-side rotor.

19. In re claim 3 Crinquette/Ohmi/Ojima disclose an evacuation apparatus according to claim 1, wherein said first vacuum pump is started after said second vacuum pump is started (note that as disclosed in col 2, line 54 to col 3, line 1, pump A is started and once that pressure gets to a certain point pump B is started).

20. In re claim 4, Crinquette/Ohmi/Ojima disclose an evacuation apparatus according to claim 1, wherein a rotational speed of said multistage pump rotors is controlled based on electric current flowing into a motor for rotating said multistage pump rotors (note that as disclosed in col 2, line 54 to col 3, line 1, pump B is started because "feed current falls off so that the current relay is no longer excited...the relay is powered so its contactors close and

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pump B is started"). Also note that this operation is done by pressure, because the suction pressure of the gas in pump A (also the gas during output) determines if pump B is turned on (see col 2, lines 65-67).

21. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shibayama or Crinquette/Ohmi/Ojima in view of Baubron (4,442,353) or Becker (5,584,669).

22. In re claim 5, Shibayama and Crinquette/Ohmi/Ojima fail to disclose an evacuating apparatus according to claim 1 wherein said first vacuum pump and said second vacuum pump are accommodated in a single enclosure.

23. Nevertheless, Baubron discloses an enclosure (11) covering multiple pumps (including vacuum pumps 28, 13). Becker discloses a similar enclosure disclosed on col 5, lines 28-30 of Becker, "the turbomolecular pump and the two-stage positive displacement pump can of course also be accommodated in a common housing (not shown)". These housings help to both organize and protect the assembly.

24. Therefore, it would have been obvious to one having ordinary skill at the time of the invention to modify Shibayama or Crinquette/Ohmi/Ojima in view of Baubron or Becker in order to add a common housing which would both organize and protect the pumping system.

25. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shibayama in view of Miura et al (6,056,510).

26. In re claim 6, Shibayama discloses an evacuation apparatus according to claim 1, but fail to disclose wherein the second vacuum pump comprises a motor (Shibayama only directly discloses the first pump comprising a motor).

27. Nevertheless, Miura discloses, while using multiple vacuum pumps in series, also using separate (brushless DC) motors (motors 5, 6, 7, 8) for each pump. Using a motor for each

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pump allows one to have more efficient control over each pump, especially if the pumps are operating at different pumping speeds.

28. Therefore, it would have been obvious to one having ordinary skill in the art to modify Shibayama in view of Miura in order to have two motors, one for each pump, in order to have more efficient control over the apparatus.

29. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crinquette/Ohmi/Ojima in view of Miura.

30. In re claim 6, Crinquette/Ohmi/Ojima disclose an evacuation apparatus according to claim 1, but fail to disclose wherein the second vacuum pump comprises a brushless DC motor.

31. Nevertheless, Miura discloses, while using multiple vacuum pumps in series, also using separate (brushless DC) motors (motors 5, 6, 7, 8) for each pump. Using a brushless DC motor ensures more efficiency because of the nature of that type of motor.

32. Therefore, it would have been obvious to one having ordinary skill in the art to modify Crinquette/Ohmi/Ojima in view of Miura in order to have higher motor efficiency by using a brushless DC motor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TODD D. JACOBS whose telephone number is 571-270-5708. The examiner can normally be reached on Monday - Friday, 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit
3746

/TODD D. JACOBS/
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